

Tongue Ranger District, Bighorn National Forest

Little Bighorn River Watershed Allotments

Dry Fork Ridge C&H
Lake Creek C&H
Lower Dry Fork C&H
West Pass C&H

Goose Creek Watershed Allotments

Big Goose C&H
Little Goose C&H
Little Goose Canyon C&H
Rapid Creek C&H
Stull Lakes C&H (Vacant)
Tourist Horse GRA
Walker Prairie C&H

Suitability Analysis

02/26/2010

Introduction:

Rangeland Suitability¹: The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.

Although there is no regulatory requirement to do a Rangeland Suitability analysis at the project level (it is only an LRMP requirement) a project level Rangeland Suitability analysis can provide useful information to the deciding officer.

The number of acres and distribution of Suitable Rangeland on an allotment can be helpful in displaying spatial distribution of forage allocated to various uses. It can be compared to known or proposed livestock use patterns, and indicate management needs; it can be a useful tool in developing management strategies and identifying opportunities. It alone is rarely used to make management recommendations.

It can be used to describe stocking levels. A tabulation of total Rangeland acres Suitable for livestock grazing on an allotment can be useful in comparing the relative stocking levels in AUMs stocked per acre of Suitable Rangeland (AUM/acre). This “stocking rate” can provide the manager an indication of 1) the level of site production necessary to support this number of animals for this time frame, 2) the level of management required to make best use of available forage, 3) the likelihood that full numbers of stock will be supported for the scheduled season, 4) the likelihood that resource problems will occur, such as overgrazing, if full permitted AUMs are grazed. It alone is rarely used to make decisions about stocking or capacities, but it gives an indication.

Rangeland Suitability analysis is not used to decide where livestock may graze. It is not a decision to graze livestock on any specific area of land, nor is it a decision about, or an estimate of, livestock grazing capacity. The Rangeland Suitability determination may or may not provide supporting information for a decision to graze livestock on a specific area. Intermingling of livestock between areas mapped as Suitable will occur on a land base of any significant size. Therefore, Rangeland Suitability determinations are not intended to imply that livestock will be precluded from being found on lands that may not be mapped as Suitable.

Many acres of forested and non-forested lands not mapped as “Suitable” still may provide forage for permitted livestock that may not be reflected in analysis. Transitory rangeland resulting from timber harvest or wildfire is normally not considered Suitable. Incidental use of livestock on lands not mapped as Suitable is normally permissible, but not necessarily planned for. Grazing or moving livestock through

¹ 36 CFR 219.3 and FSM 1905

areas not mapped as Suitable is not prohibited under law, policy regulation or Forest Plan direction. In addition, the use of these areas is considered incidental and these areas are generally not preferred by livestock due to aspect, slope, lack of forage, etc. Areas not mapped as Suitable are included within allotments because of their intermingled nature and because it is more efficient and cost effective to locate allotment and pasture boundaries on ridgelines and other manageable geographic boundaries rather than attempting to arbitrarily require livestock to only be on specific acres that are determined to be Suitable. This would be extremely difficult if not impossible.

Actual stocking will be based on annual production, a history of meeting annual utilization guidelines, and meeting or moving toward the desired conditions. When guidelines for any year have been met, the livestock must be moved out of the key area, or they will be removed from the pasture or allotment. The permitted number and season of use is subject to change based on evidence of actual use and performance.

Analysis:

An assessment of suitable rangeland was completed as part of the Big 6 Allotment analysis. It began with a review of the 2005 Forest Plan landscape level rangeland suitability clipped to the Goose Creek and Little Horn (for the eleven allotments listed below) watersheds.

Based upon review of the above data, review of the mapped areas of suitable rangeland in this modeling exercise, and in comparison with existing range analysis and on-the-ground experience of BNF staff and the ID team, it is clear that the data used in revision of the Forest Plan is of limited value in site-specific application without extensive additional updating. Areas of considerable size that are known to be considered suitable for livestock grazing, as well as some areas known not to be suitable are not accurately displayed. Some large areas known to provide forage are omitted entirely, while in other areas rangeland is included that is not used by livestock. Polygons are inconsistent with actual known areas of forage and types on-the-ground in site-specific areas.

Existing rangeland analysis data was reviewed in conjunction with trend monitoring, permitted use and actual use for these allotments. Long term trend monitoring showed, in the majority of cases, vegetative conditions were not meeting desired conditions and the existing rangeland analysis indicated stocking rates were greater than two suitable acres/AUM on most allotments. Actual use and authorized use records show, in most cases, that use on the allotments was less than permitted. This contradiction between stocking rates and vegetative conditions prompted a more in-depth review of the existing range analysis data. An updated analysis of suitable range acres within the Goose Creek and Little Horn project areas was conducted using GIS information, as described below. Tables F-1 and F-2 (below) compare the three analyses.

2010 Analysis Model

Geospatial Information files used in this analysis are:

1. Bighorn Slope, Raster (30 meter resolution),
(T:\FS\Reference\GIS\r02_bnf\Data\RasterData\DEM_30m.gdb\Slope_30m)
2. Pasture Boundaries, Vector, (BNF_Vector.sde\S_R02_BNF.Range\S_R02_BNF.rmu_subunit)
3. Soils Boundaries, Vector, (BNF_Vector.sde\S_R02_BNF.Terrestrial
S_R02_BNF.Soil_Map_Units)
4. 2009 NAIP Aerial Imagery

These files were pulled from SDE at the inception of the Big 6 project and were kept static throughout the environmental analysis.

Process:

1. Bighorn Slope raster was converted to a polygon shapefile

- a. During this conversion process, the software combined adjacent raster areas with the same slope values into polygons of irregular shape, larger than 30 meters by 30 meters. Where these larger polygons encompass both timbered and meadow/grassland vegetation (or water/other feature), they were manually split according to the 30 meter grid.
2. Bighorn Slope shapefile was intersected with:
 - a. allotment boundaries and
 - b. soils boundaries shapefiles
3. Selected for any polygons, within the resulting shapefile, where the minimum soil production value ([Min_Prod]) was greater than or equal to 500 lbs/ac AND the percent slope value ([Gridcode]) was less than or equal to 45. The polygons selected by these criteria were initially categorized as suitable range. Polygons NOT selected by these criteria were categorized as unsuitable range.
 - a. The main portion of the vacant Stull Lakes C&H was not analyzed for suitable range because it is not proposed to be stocked. Only the Antler Creek portion of the vacant Stull Lakes allotment was analyzed for suitable range.
4. Polygons initially categorized as suitable range were further refined over the 2009 NAIP imagery. Polygons meeting the criteria listed in appendix A1 were excluded from the suitable base.

Table F- 1: Goose Creek Watershed Allotments

Allotment	Permitted AUMs	2005 Forest Plan Model		1981 Revised Range Analysis			2010 Updated Analysis		
		Suitable Acres	Acres/AUM	Allotment Total Acres	Allotment Suitable Acres	Suitable Acres/AUM	Total Acres	Suitable Acres	Suitable Acres/AUM
Big Goose C&H	698	1,028	1.5	11,196	1,213	1.7	11,260	915	1.3
Little Goose C&H	1,208	1,906	1.6	28,599	2,601	2.2	28,731	1,877	1.6
Little Goose Canyon C&H	137	71	.5	1,235	471	3.4	1,152	218	1.6
Rapid Creek C&H	1,793	2,046	1.1	13,760	2,615	1.5	14,414	1,797	1.0
Stull Lakes C&H	N/A	183	--	15,773	1,880	--	20,264	--	--
Antler Creek*	N/A	17	--	2,832	720	--	2,928	46	--
*The numbers for Antler Creek are a subset of the total Stull Lakes figures.									
Tourist C&H	72	342	4.8	4,524	885	12.3	5,071	326	4.5
Walker Prairie C&H	1,328	2,820	2.1	33,392	3,213	2.4	31,372	2,117	1.6

Table F- 2: Little Horn Watershed Allotments

Allotment	Permitted AUMs	2005 Forest Plan Model		1981 Revised Range Analysis			2010 Updated Analysis		
		Suitable Acres	Acres/AUM	Allotment Total Acres	Allotment Suitable Acres	Suitable Acres/AUM	Total Acres	Suitable Acres	Suitable Acres/AUM
Dry Fork Ridge C&H	229	712	3.1	7,257	877	3.8	7,493	618	2.7
Lake Creek C&H	2,192	3,157	1.4	--	3,992	--	29,408	3,411	1.6
Lower Dry Fork C&H	535	794	1.5	7,472	3,227	6.0	7,173	1,460	2.7
West Pass C&H	591	560	0.9	2,088	1,363	2.3	2,485	884	1.5